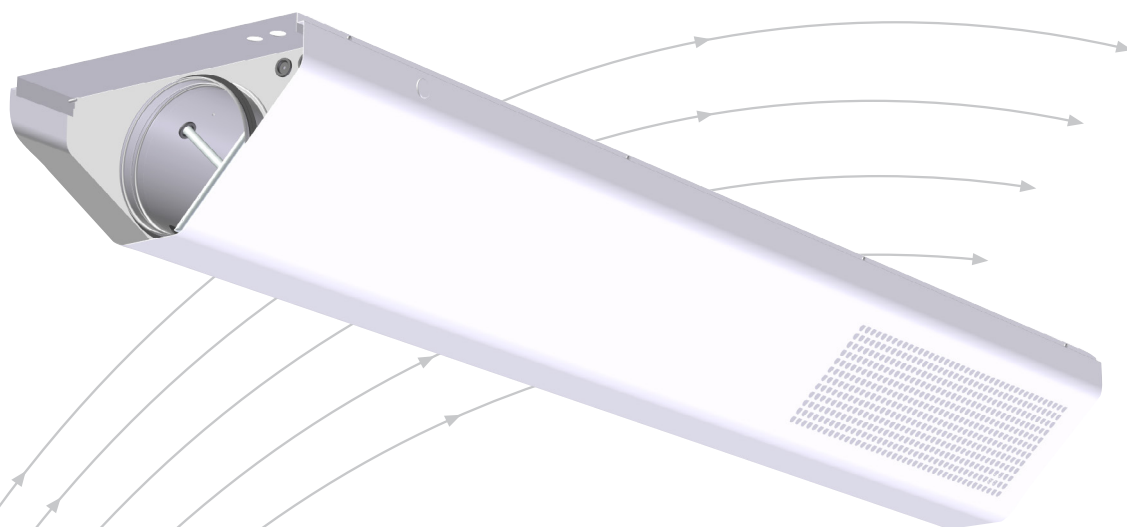


TUB-VAV

Diffuser with integrated VAV
for open installation



- Ideal for large premises
- Large working range
- Integrated VAV unit
- Variable flow patterns
- Available in 2, 4 and 6-metre lengths

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 **Auranor**

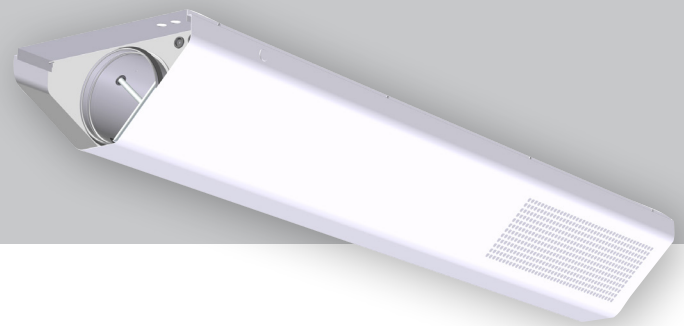
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TUB-VAV



APPLICATION

TUB-VAV is a supply diffuser for open installation, and is developed to suit premises with high requirements for comfort and design. The diffuser can either be mounted to the ceiling away from the wall or be installed in the corner between wall and ceiling.

DESIGN

TUB-VAV features a removable front panel with LØV perforation. The unit is available with two different flow patterns, and in 2, 4 and 6-metre lengths. A 1/2 curved design is used for open ceiling mounting, and a 1/4 curved design is used for installation in corner between wall and ceiling. TUB-VAV is equipped with an integrated VAV unit, and is standard delivered with MP-Bus. TUB-VAV is also available with MOD-bus, BACnet, KNX and MOD-bus for X-AIRCONTROL. Back panel to accommodate wall mounting can be supplied.

Actuator	LHV-D3-MP/MOD/BACnet
Operating voltage	AC 24 V 50/60 Hz, DC 24 V
Power drain	2,5W
Dim. effect	4.5VA (max.8 A @5 ms)

Table 1: Technical specifications, Belimo VAV controller

MATERIALS AND SURFACE COATING

The diffuser front is in a steel design with a RAL 9003-gloss 30 finish. Other colours are available on request. The back plate is in a galvanised steel design. The measurement is in aluminium, and hoses and nipples are in plastic. The damper is equipped with polyester material, and the connection collar is fitted with EPDM rubber gasket.

QUICK SELECTION

TUB-VAV	[m³/h]			
Dim.	Length	25 dB(A)	30dB(A)	35 dB(A)
160	All	295	360	434
200	All	400	470	570
250	All	605	720	820

Table2, Air flow rates TUB-VAV at given sound power levels and open damper. Table applies to both 1/2R and 1/4R execution and all lengths.

TUB-VAV	[m³/h]			
Dim.	Length	25 dB(A)	30dB(A)	35 dB(A)
160	All	338	360	576
200	All	421	522	720
250	All	533	720	900

Table 3, Air flow rates TUB-VAV at given sound power levels 75 Pa pressure loss. Table applies to both 1/2R and 1/4R execution and all lengths.

LHV-D3	(m³/h)		Deviation for working range: 10 - 20% of Vnom: ±25% 20 - 40% of Vnom: <±10% 40 - 100% of Vnom: <±4%
ØD.	Minimum	Maximum	
160	43	434	
200	70	700	
250	106	1060	

Table 4: Adjustment range for VAV controller, air flow rate in m³/h. See calculation diagram for sound power level and pressure drop.

DIMENSIONS AND WEIGHT, TUB-VAV

Dim.	Design	H	B	Bs	Weight[kg]
160	1/2-curved	200	350	175	22
200	1/2-curved	245	456	228	27
250	1/2-curved	295	578	289	34
160	1/4-curved	200	310	115	22
200	1/4-curved	245	408	160	27
250	1/4-curved	295	523	215	34

Table 5 (Weight indicated in table applies to length 2 meters).

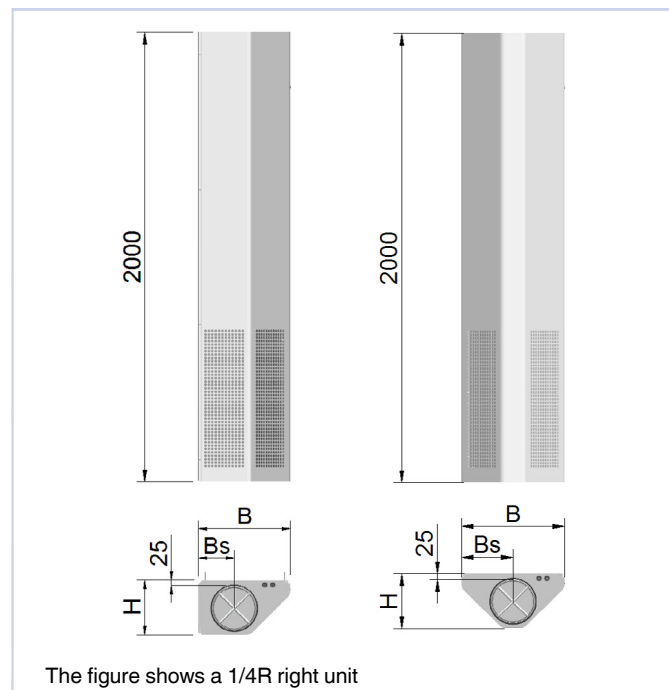
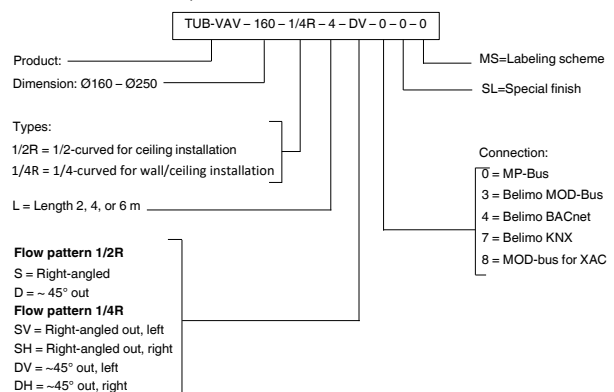


Fig. 1

ORDER CODE, TUB-VAV



Example:
TUB-VAV - 160 - 1/4R - 4 / DV / 0 / 0 / 0
Explanation:
TUB-VAV dim. Ø160 length:4 m. for wall/ceiling installation,
Flow pattern: ~45° out, left, with MP-Bus connection, painted standard white
RAL 9003 - gloss 30, without labeling scheme.

TUB-VAV

ACOUSTIC DATA

The diagrams provide a summary of the A-weighted sound power level from diffuser, L_{WA} . Correction factors in table 6 are used to calculate emitted sound power level at the respective frequencies, $L_w = L_{WA} + KO$. A room with absorption equivalent to 10 m² Sabine will have a sound pressure level which is 4 dB below the sound power level emitted.

Example:

A small classroom requires an air flow rate of 600 m³/h on each of 2 pcs. TUB-VAV dim. 250 of length 4m. Room attenuation is 7 dB and it is been calculated that the damper should be choked to 75 Pa total pressure loss.

We aim to find:

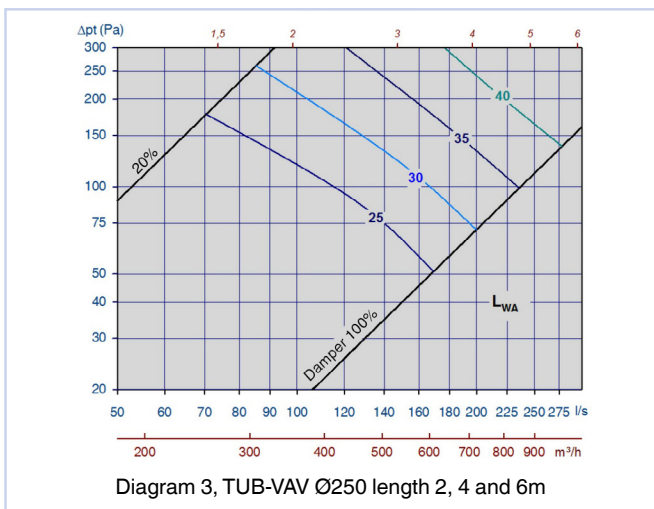
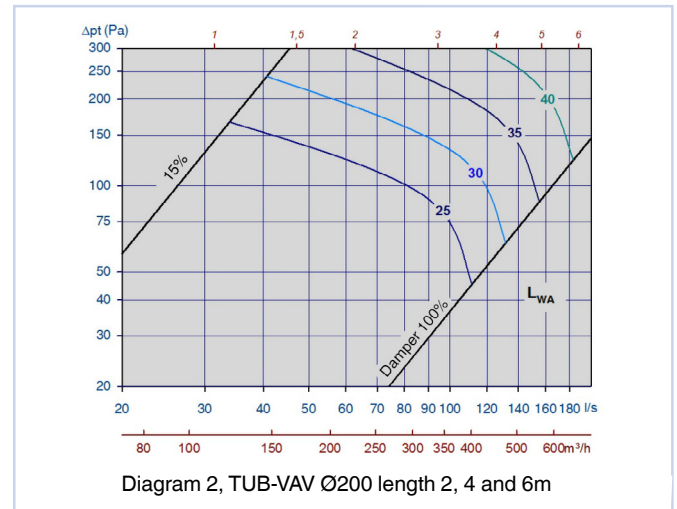
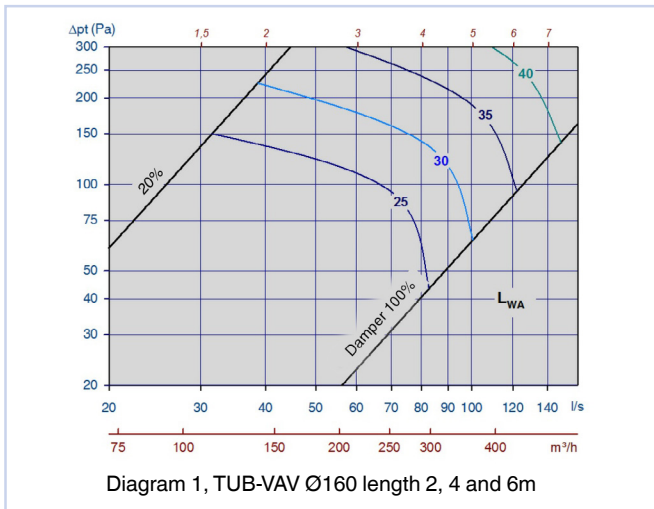
- Pressure loss and resulting A-weighted sound pressure level of one valve and open damper.
- Emitted sound power level from one valve at 250 Hz.
- The resulting sound power level of two valves, and the calculated effects of room attenuation.

a) From diagram 3 we find that the pressure loss at 167 l/s (600 m³/h) with open damper is 52 Pa. Sound power level from one valve is 27 dB(A).

b) According to table 6 the correction factor for 250 Hz is -1 dB. Emitted sound power level: $L_w = L_{WA} + KO = 27 + (-1) = 26$ dB.

c) With two similar valves in the room the sound increases by 3 dB. $27 + 3 = 30$ dB (A). The resultant sound level in the room's occupied zone is reduced by means of the room attenuation to: $30 - 7 = 23$ dB(A).

CALCULATION DIAGRAMS



TUB-VAV

Static sound attenuation incl. end reflection, TUB-VAV

TUB-VAV		Attenuation [dB]							
Dim.	Length	63	125	250	500	1k	2k	4k	8k
160	2m	21	14	12	12	15	17	15	13
	4m	18	14	11	9	12	11	7	11
	6m	25	13	11	10	14	14	13	14
200	2m	15	11	9	9	13	16	12	11
	4m	20	14	11	9	12	12	9	9
	6m	23	12	10	10	13	12	10	11
250	2m	11	11	8	9	12	13	10	9
	4m	13	12	9	9	10	10	7	8
	6m	14	11	9	9	12	11	9	9

Table 5

Correction factor [KO], TUB-VAV

TUB-VAV		KO [dB]							
Dim.		63	125	250	500	1k	2k	4k	8k
Ø160		-5	-3	0	-1	-6	-12	-15	-16
Ø200		-6	-1	0	-1	-6	-12	-15	-16
Ø250		-7	-2	-1	-2	-5	-12	-15	-15

Table 6

TUB-VAV

THROW LENGTHS

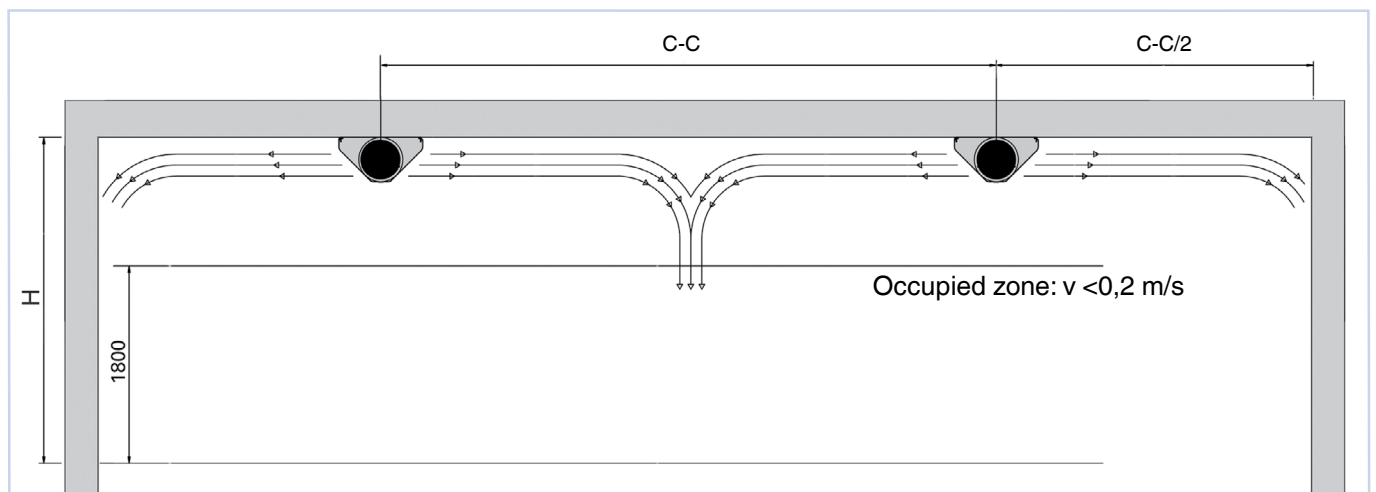
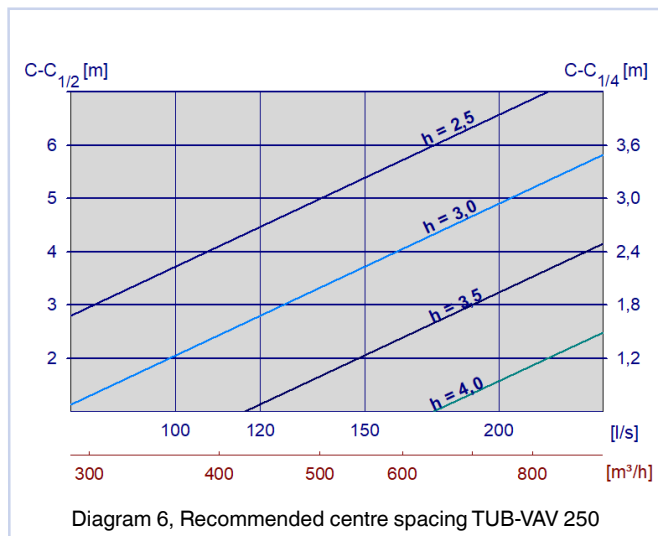
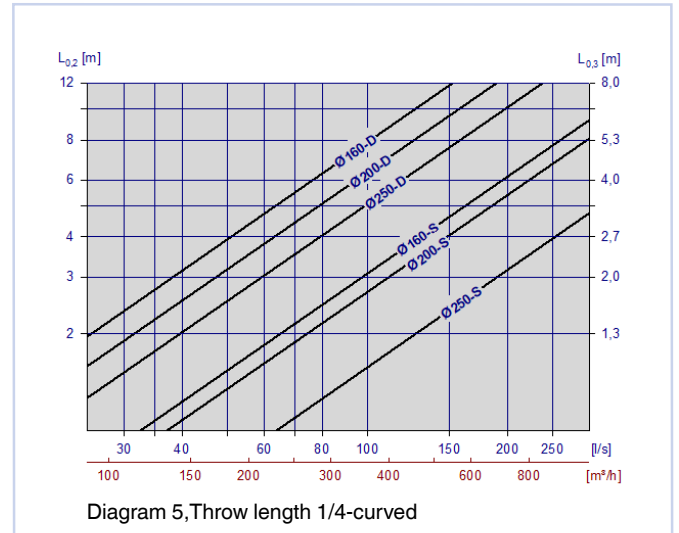
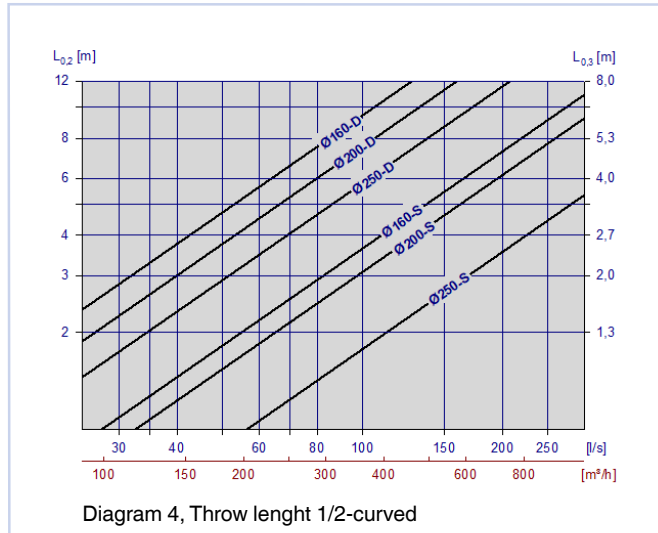


Fig 2, Explanation to diagram 6

TUB-VAV

 **FLOW PATTERN**

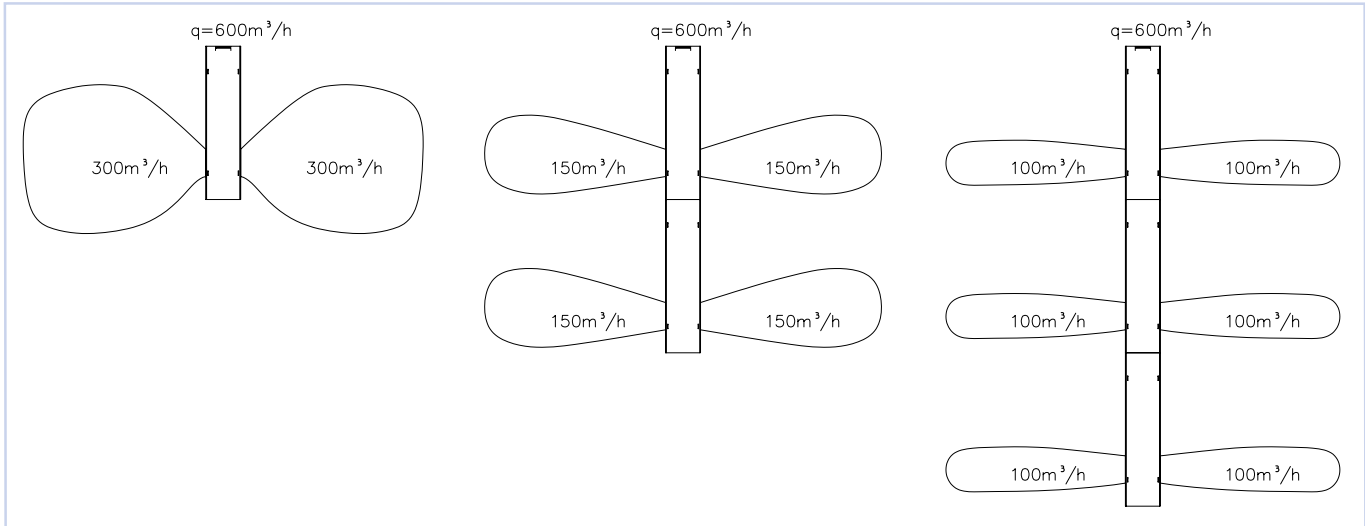


Fig 3, TUB-VAV 1/2 R, flow pattern in plan view.

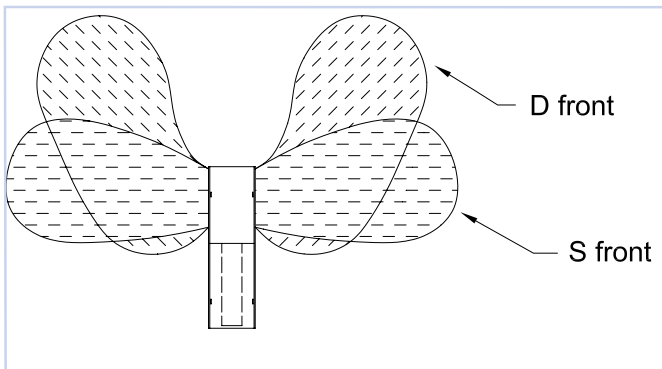


Fig 4, TUB-VAV 1/2 R flow pattern in plan view.

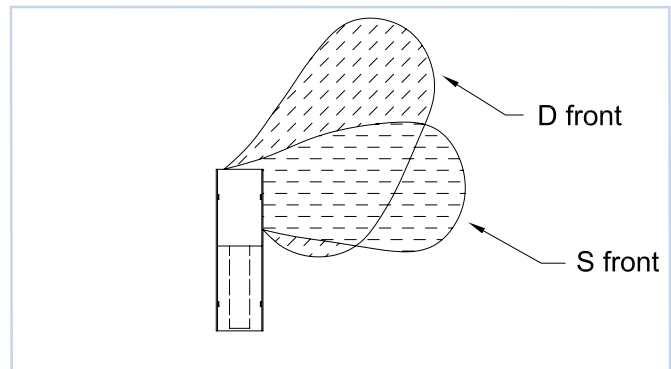


Fig 5, TUB-VAV 1/4 R flow pattern in plan view, right.

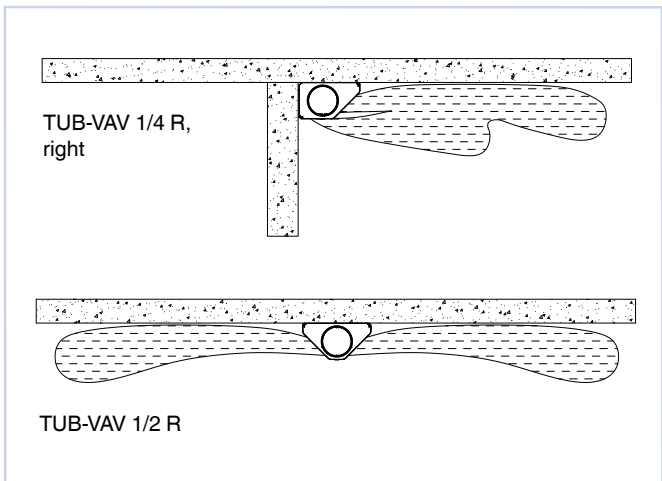


Fig 6, TUB-VAV 1/4 R and TUB-VAV 1/2 R flow pattern in cross-section view.

TUB-VAV

INSTALLATION

TUB-VAV is prepared for ceiling installation with four screws, it is slots for those in the back plate. The valve front is then mounted to the device. See fig. 7.

If several units are to be installed, the recommended centre spacing is provided in diagram 6 and fig. 2, page 5.

Please see separate guidelines for installation of 4m and 6m lengths.

By mounting in branch off it is recommended min. 5xDia. distance between branch and TUB-VAV. TUB-VAV can be mounted directly after bends, without affecting measurement accuracy.

COMMISSIONING

TUB-VAV uses Belimo PC-Tool or ZTH-Gen in order to make the requisite adjustments

MAINTENANCE

The diffuser front can be cleaned by using a damp cloth. For internal cleaning, please remove the diffuser front to gain access.

ENVIROMENT

Enquiries regarding product declaration can be directed to our sales team, or information can be found on our website: www.trox.no

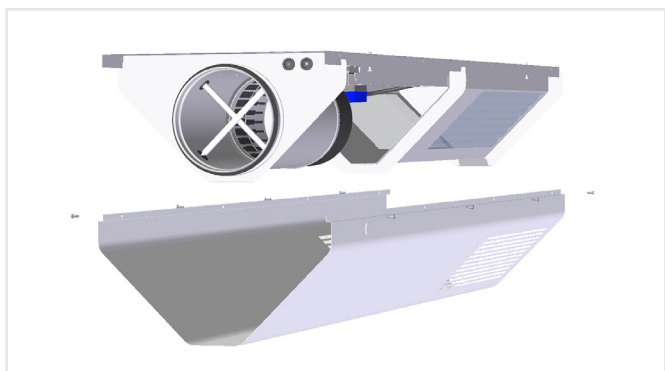


Fig 7, installation

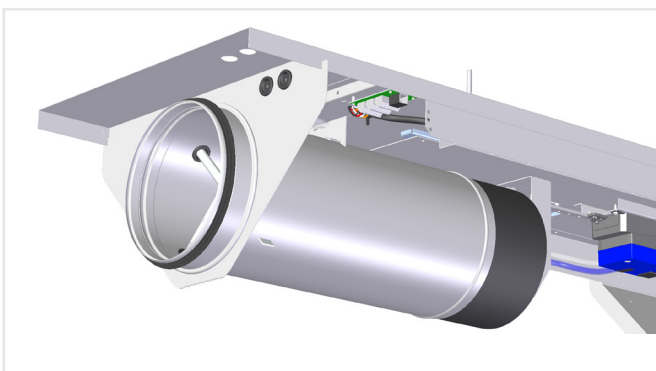


Fig 8, location of connection

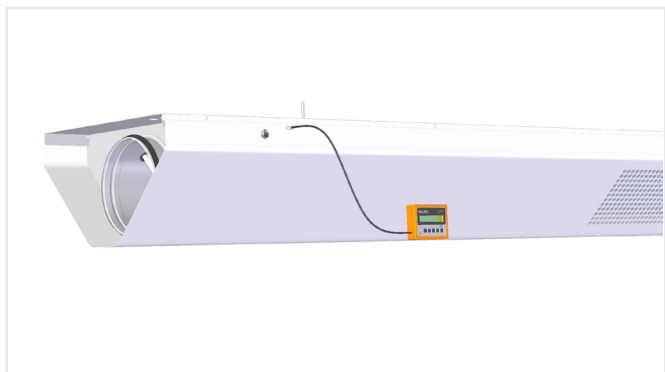


Fig 9, connection of ZTH for balancing via RJ12 cable

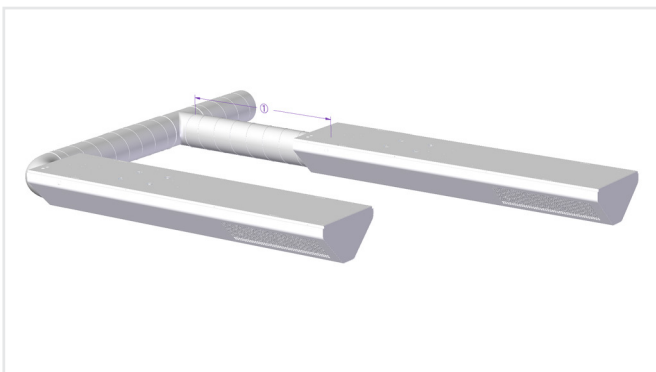


Fig 10, installation into doctwork ① Recommended min. 5 x Dia.

TUB-VAV is developed and manufactured by:

The company reserves the right to make amendments without prior notice.